

A heavy sea was running on the lake, and no vessels arrived or departed. On the 17th heavy gales prevailed in the Atlantic coast states from North Carolina to Maine. A report from Southport, N. C., states that a schooner went ashore on Piney Point Beach, about 3 miles sw. of that place. At Washington City heavy rain and high wind from the ne. caused considerable damage; maximum wind velocity 48 miles, with an extreme velocity of 50 miles per hour. At Baltimore, Md., the wind reached a velocity of 39 miles per hour from the ne., this being the highest velocity recorded there in December, with one exception; a great amount of damage was reported; vessels in the harbor dragged their anchors, and several small craft were sunk; many roofs were blown off; steamers were delayed; and much damage was caused throughout the state and along the neighboring coasts. At Philadelphia, Pa., the wind reached a velocity of 48 miles per hour, and damage was caused to plate glass store windows, telegraph wires, etc. A ne. gale prevailed at Harrisburg, Pa.; several old houses were unroofed, and poles were blown down. At Woodbury, N. J., a heavy ne. gale, with rain, prevailed. At Atlantic City, N. J., rain and high ne. winds began in the early morning. The tide was unusually high and the meadows were submerged. The electric street car sheds were blown down, and the damage to buildings and cars was estimated at \$10,000. Several other buildings were damaged. At New Brunswick, N. J., a heavy ne. storm of wind and rain set in in the early morning and continued all day, causing high water in the Raritan River, and doing damage to trees, etc. At New York City a severe ne. storm prevailed, the maximum wind velocity, 48 miles, being reached at 4.25 p. m. Traffic on the rivers and bays was practically suspended. Many wrecks were reported along the coast. Much damage was caused along the New Jersey coast by high seas. In the vicinity of New York City 17 schooners were dismasted and 4 steamers driven ashore. At New Haven, Conn., a heavy ne. gale prevailed, with heavy rain, in the afternoon and evening. Much damage was done to electric lights; cellars were flooded, and steamers were delayed. At Block Island, R. I., a violent ne. storm, with a maximum wind velocity of 82 miles per hour at 6.23 p. m., and an extreme velocity of 96 miles per hour, prevailed. Buildings, etc., were damaged to the extent of about \$1,000.

On the 23d a heavy wind storm prevailed over the Lake region. At Barborton, 5 miles south of Akron, Ohio, a building was demolished, killing one person and injuring several. At Sault de Ste. Marie, Mich., the storm was the severest of the season, high wind and snow continuing all day; maximum wind velocity 50 miles per hour from the nw. The roof of a hotel was damaged to the extent of about \$500. At Milwaukee, Wis., the wind attained a velocity of 42 miles per hour from the nw., and all vessels remained in port. At Detroit, Mich., the wind reached a velocity of 51 miles from the sw.; a market building was blown down, and 3 persons seriously injured. At Buffalo, N. Y., the wind reached a velocity of 54 miles per hour, and the lake was very rough. On the 25th a severe storm of wind and rain prevailed over Washing-

ton, Oregon, and west Montana. At Seattle, Wash., a gale from the sw., with rain, began 5 a. m. and ended 9 a. m., the estimated wind velocity being 60 miles per hour. Shipping was damaged to the extent of about \$20,000, and on the railroads the damage amounted to about \$30,000. At Olympia, Wash., a wind storm, with rain, began 7.15 a. m. and ended 9.25 a. m., with maximum velocity 30 miles per hour from the sw. In the city a large barn was blown down, damage \$2,000, and about 12 miles from Olympia 2 men and a horse were killed by a falling tree. Some damage was done on Puget Sound about Tacoma and Seattle. At Portland, Oregon, the wind reached a velocity of 35 miles per hour. At Astoria, Oregon, a violent sw. gale, with rain, began 3 a. m. and ended in the early morning, causing slight damage to shipping and buildings. At Helena, Mont., a heavy w. gale, with maximum velocity 60 miles per hour, prevailed from 4 p. m. to 11.50 p. m., during which out-buildings, roofs, etc., were damaged to the extent of about \$5,000. On the 26th high wind, with heavy snow, prevailed in the middle Atlantic coast states, and New England. At Vineyard Haven, Mass., a fierce e. gale, with heavy snow and rain, began at 6 a. m., during which a schooner and a brig at that port were damaged. At Block Island, R. I., a violent storm from the e., with heavy snow, began 4.20 a. m.; attained a velocity of 69 miles per hour at 6.34 p. m.; an extreme velocity of 108 miles per hour at 6.42 p. m., and ended 9.05 p. m. No damage was reported at that place. At Narragansett Pier, R. I., a high ne. gale began during the early morning, and heavy snow at 8 a. m. A three-masted schooner went ashore one-fourth mile north of the station. The crew were taken off by the life-saving crew. The vessel and cargo, valued at \$20,000, were a total loss. A schooner went ashore 2 miles south of the station. The vessel went to pieces in less than 20 minutes, and before the life-saving crew could reach them the captain, steward, and one sailor were lost. The vessel and cargo, valued at \$20,000, were a total loss. At New Haven, Conn., a heavy ne. gale, with snow and sleet, began 5.50 a. m., and ended before midnight. Traffic on street and railroad cars was interrupted, and the New York boats did not run. At New York City light and heavy snow continued during the day. The wind reached 38 miles per hour from the ne. at 5.05 p. m., and backed to n. at 9.10 p. m. The storm was very severe along the coast, and navigation about New York City was practically suspended. No vessels left the port of New York, and 3 wrecks were reported on the New Jersey and Long Island coasts. At New Brunswick, N. J., a severe ne. gale, with heavy snow, prevailed. The snow drifted heavily, causing delay to trains. At Creighton, Nebr., a severe nw. gale caused damage to chimneys, etc. At Sioux City, Iowa, the wind reached a velocity of 36 miles per hour from the s. at 4.05 a. m., and a velocity of 40 miles per hour from the nw. at 4.10 p. m. On the 31st a thunder-storm, doing considerable damage, was reported at Dadeville, Mo. At Abilene, Tex., high s. to w. winds, reaching a velocity of 60 miles per hour from the w., caused much damage to roofs, signs, etc. At Childress, Tex., a heavy gale damaged buildings to the extent of about \$200.

INLAND NAVIGATION.

ICE IN RIVERS AND HARBORS—CLOSING OF NAVIGATION.

Lake Ontario.—A steamer left Oswego, N. Y., on the 13th; this was the last departure of the season.

Lake Erie.—At Buffalo, N. Y., navigation closed on the 8th; no ice visible on the lake or river on that date. 28th, ice on the lake to the outer breakwater, the first ice of the season. At Erie, Pa., the first ice of the season formed on the bay during the night of the 8-9th. At Cleveland, Ohio, the river custom-house closed on the 9th, indicating the closing of navigation for the season. At Sandusky, Ohio, navigation closed on the 6th.

Lake Huron.—Navigation closed at Port Huron, Mich., on the 25th. At Alpena, Mich., floating ice was reported in Thunder Bay River from the 1st to 4th. On the 8th the bay and river were frozen over and navigation fully suspended.

Lake Michigan.—On the 25th considerable floating ice, extending one-half mile out, was reported along the shore of the lake at Chicago, Ill. At Milwaukee, Wis., navigation closed on the 5th.

Green Bay.—Navigation closed at Green Bay, Wis., on the 4th, the lights at Grassy Island and Long Tail Point being discontinued for the season.

Lake Superior.—Navigation closed at Marquette, Mich., on the 3d, and at Duluth, Minn., on the 4th.

Otsego Lake closed at Cooperstown, N. Y., on the 25th, the earliest date since 1878. Lake Champlain was frozen at Plattsburgh Barracks, N. Y., on the 31st.

The Androscoggin River closed at Livermore Falls, Me., and the Penobscot River at Bangor, Me., on the 1st.

Connecticut River.—Reports indicated that navigation closed on the 16th.

Hudson River.—Navigation practically closed on the upper Hudson on the 3d. On the 30th the Hudson and East Rivers were filled with floating ice at New York City, although the ice was not heavy enough to seriously interfere with navigation. Five miles up the Hudson it had been almost entirely suspended. A report from Catskill, N. Y., dated the 8th, stated that "navigation on the Hudson closed this year earlier than it has since the year 1880, and that the dates for the closing of the river at that point are as follows: 1889, January 8; 1888, December 19; 1887, December 22; 1886, December 4; 1885, December 8; 1884, December 19; 1883, December 18; 1882, December 7; 1881, January 2; 1880, December 1. In 1888 the river, though closed on December 19, was subsequently opened, and tow-boats ran until January 20, and the same conditions were possible last year."

Susquehanna River.—Navigation closed at Wilkes Barre, Pa., on the 1st. The river was filled with large cakes of floating ice on the 8th; clear of ice on the 18th; floating ice on the 19th and 20th; closed on the 21st; open on the 24th; and closed on the 28th.

Delaware and Schuylkill Rivers.—On the 3d light ice formed in the Delaware River at Philadelphia, Pa., and the Schuylkill River was frozen over at that point.

Monongahela River.—Navigation was closed at Morgantown, W. Va., on the 28th, and at Greensborough, Pa., on the 29th.

Ohio River.—Floating ice was reported at Marietta, Ohio, on the 11th, 15th, 17th, 19th to 22d, 25th to 27th, and 29th to 31st.

Sandusky River.—The river was frozen at Tiffin, Ohio, on the 3d.

Maumee River.—The river was frozen at Toledo, Ohio, on the 7th, and navigation closed on the 11th.

Detroit River.—Ice was running in the river and navigation was generally closed at Detroit, Mich., on the 3d. Floating ice in the river 6th, 7th, 11th, 15th, 18th, 20th, 25th, and 28th to 30th. The last vessels of the season passed Detroit on the 12th.

Black River.—The river was completely frozen over at Port Huron, Mich., for the first time this season on the 2d.

Saint Mary's River.—The last boat of the season passed down on the 3d, closing navigation.

Mississippi River.—At Saint Paul, Minn., the river was frozen over on the 2d. There was considerable floating ice at La Crosse, Wis., on the 2d. At Red Wing, Minn., the river was frozen over on the 2d. Lake Pepin was frozen during the night of the 2-3d. At Dubuque, Iowa, the river was frozen on the 4th. At Davenport, Iowa, ice was running in the river

on the 3d to 14th, 27th, and 30th. The Rock River was frozen over at Rockford, Ill., on the 4th.

Missouri River.—Ice was running at Fort Buford, N. Dak., on the 2d, and the river closed at that point the night of the 3d-4th. The river was closed at Fort Yates, N. Dak., on the 6th. Ice was running at Fort Sully, S. Dak., from the 1st to 4th, and the river closed at that point on the 6th. On the 8th and 9th a large quantity of ice was running at Leavenworth, Kans.; 10th, river free from ice; 13th, heavy floating ice; 14th, river free from ice; 18th, considerable floating ice; 19th, river free from ice; 25th to 30th, river filled with floating ice. At Kansas City, Mo., floating ice was reported on the 7th, 8th, and 9th. At Saint Joseph, Mo., running ice in the river 5th to 10th and 24th to 30th. On the 31st the river was clear.

Yellowstone River.—Ice was reported in the river at Glendive, Mont., on the 7th.

Erie Canal.—On the 2d water was drawn off west of Little Falls, N. Y. Over fifty boats were reported frozen in, forty between Schenectady and Amsterdam, and about twelve at Crescent.

Morris Canal.—The canal closed for the season on the 18th; several boats were frozen in.

STAGE OF WATER IN RIVERS AND HARBORS.

The following table shows the danger-point at the several stations; the highest and lowest water during December, 1890, with the dates of occurrence and the monthly ranges:

Heights of rivers above low-water mark, December, 1890 (in feet and tenths).

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River.</i>						
Shreveport, La.	29.9	10	17.7	29	7.7	10.0
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	27	12.3	24	3.0	9.3
Little Rock, Ark.	23.0	30	15.1	24	5.8	9.3
<i>Missouri River.</i>						
Fort Buford, N. Dak.						
Kansas City, Mo.	21.0	5	5.5	11, 13, 14	3.1	2.4
<i>Mississippi River.</i>						
Saint Paul, Minn.	14.5					
La Crosse, Wis.	13.0					
Dubuque, Iowa	16.0					
Davenport, Iowa	15.0	1	2.4	12	0.2	2.2
Keokuk, Iowa	14.0	1, 2, 3	2.1	13	0.6	2.7
Saint Louis, Mo.	32.0	1	6.8	30, 31	2.8	4.0
Cairo, Ill.	40.0	31	19.6	25	8.7	10.0
Memphis, Tenn.	34.6	1	16.3	26, 27	7.2	9.1
Vicksburg, Miss.	41.0	1	26.5	30	10.7	15.8
New Orleans, La.	13.0	4, 5	8.3	31	4.3	4.0
<i>Ohio River.</i>						
Pittsburgh, Pa.	22.0	24	10.8	16, 17	3.0	7.8
Parkersburg, W. Va.	38.0	25	16.2	3, 19	6.2	10.0
Cincinnati, Ohio	50.0	29	31.5	5, 6, 7	12.3	19.2
Louisville, Ky.	25.0	30	12.8	6, 7	6.4	6.4
<i>Cumberland River.</i>						
Nashville, Tenn.	40.0	31	24.4	5	3.2	21.2
<i>Tennessee River.</i>						
Chattanooga, Tenn.	33.0	29	12.9	3, 4, 5	2.3	10.6
Knoxville, Tenn.		28	6.4	3	0.4	6.0
<i>Monongahela River.</i>						
Pittsburgh, Pa.	29.0	24	10.8	16, 17	3.0	7.8
<i>Savannah River.</i>						
Augusta, Ga.	32.0	9	15.4	3	6.7	8.7
<i>Willamette River.</i>						
Portland, Oregon	15.0	16, 17	3.1	8	2.2	5.3

• Frozen.

ATMOSPHERIC ELECTRICITY.

AURORAS.

Auroras were reported as follows: 3d, Saint Vincent, Minn. 4th, Carson, Iowa. 11th, Vevay, Ind. 14th, Webster, S. Dak. 29th, Appleton City, Mo. 30th, Seymour, Ind.

On the 3d, at Saint Vincent, Minn., a distinct auroral arch, about 8° in altitude and extending from 165° to 215° of azimuth, was observed from 8.40 to 11.50 p. m.; 75th meridian time. The arch was about 1° in width and of a whitish color.

THUNDER-STORMS.

Thunder-storms were reported as follows: east of the Rocky Mountains thunder-storms were reported in the greatest number of states, 8, on the 3d; in 7 on the 6th and 31st; in 6 on the 7th; in 5 on the 5th; in 2 on the 8th, 24th, and 25th; and in 1 on the 4th, 18th, and 26th. On dates other than those named no thunder-storms were reported.

East of the Rocky Mountains thunder-storms were reported on the greatest number of dates, 5, in La. and Miss.; on 4 in N. C., Tenn., and Tex.; on 3 in Ala., Fla., Ga., and S. C.; on